FOSTERING THE WAY OF SAINT JAMES THROUGH PERSONALIZED AND GEOLOCATED TV CHANNELS

by

Sonia Mª. Valladares Rodríguez, Jose M. Fernández Iglesias, and Luis E. AnidoRifón
Department of Telematics Engineering,
University of Vigo, Vigo, Spain
E-mail: soniavr@det.uvigo.es, manolo@det.uvigo.es, lanido@det.uvigo.es

ABSTRACT

The Way of Saint James is the most famous pilgrimage route across Europe, and a major Spanish tourist attraction. We describe the development of a novel platform aimed to enhance the pilgrims' experience when walking the Way, to improve connectivity among pilgrims, and to promote its international dissemination. This system facilitates access to information and entertainment through a network of personalized and geolocated TV channels according to pilgrims' profiles and locations. Visitors' language, interests (e.g. food, nature, religion, architecture, sports, history) or their specific location along the pilgrimage route are taken into account to automatically configure customized programming grids that can be enjoyed anywhere anytime. The underlying technological objective of this project is to design and develop a multi-view video distribution system and platform capable of providing recommendations on content by means of smart recommendation algorithms and collaborative tagging of content. This platform provides a three-way path to content. First, users can access their personalized TV offer anywhere along the route using a mobile device (e.g. smartphone, or tablet). Second, hostels and other accommodation facilities along the Way provide TV programs customized to each facility through classical TV sets. Besides standard TV content, this approach will serve to communicate specific offers and other commercial proposals, broadcast information about landmarks in their vicinity, or to provide weather forecasts and other advice. Finally, these lodging facilities will facilitate mobile access through wireless access points to the two types of TV channels enumerated above. This proposal also contributes to foster the quality and sustainability of the Way of St. James as a touristic destination, which in turn will benefit our visitors, the Spanish society, and the industrial and commercial infrastructure.

KEYWORDS
Saint James, Pilgrimage Route, Geolocated TV Channels

INTRODUCTION

The Way of Saint James [1]as a contribution to personal and spiritual development is an environment in which the application of ICTs may improve its quantitative and qualitative impact and its global recognition. Presently, services available to pilgrims when completing their journey are related primarily to weather and route information, difficulties to overcome, or places to visit. The solution discussed in this paper is intended to contribute to improve the overall pilgrims' experience by providing a collection of online interactive and accessible services customized to the profile and location of individual pilgrims. In line with the philosophy of the Way, the proposed solution has an important social component. Therefore, accessibility, customization and global connectivity are considered fundamental aspects.

To achieve this objective, our initial task was to conduct a study of the state of the art, which included the several technologies that underpin this development, namely interactive TV [2], mobile and geolocation technologies, and smart, semantic-based [3] recommendation technologies. Besides the multimedia distribution solution that constitutes the main contribution of this platform, we have also implemented a collaborative resource tagging system to support the automated generation of a personalized programming grid. In other words, this collective knowledge base has been used to develop algorithms to generate a customized multimedia content schedule according to specific usage profiles, namely pilgrims and accommodation facilities along the Way. Similarly, we have developed a content review service that ensures compliance with certain relevant considerations (e.g., copyright verification, suitability ofmultimedia material to the intended audiences, correctness of the tags generated, etc.).

Among the main features of thedeveloped platform is its multi-device orientation.Access to content can be performed through mobile devices, or through Home Theater Personal Computers (HTPC [4]) connected to standard TV sets available at accommodation facilitiesalong the Way. HTPC-TVs willbroadcast a programming grid configured by

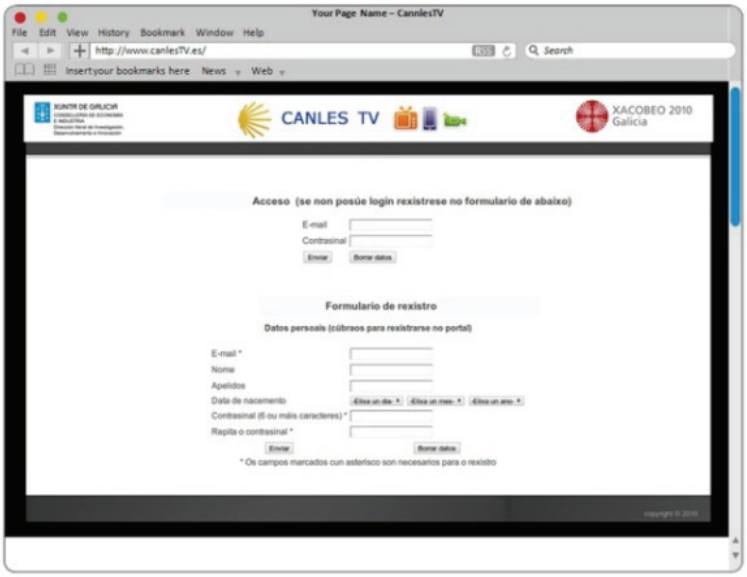
the administration of each facility including multimedia assetsselected from a repository of audiovisual content that is fed from different sources:

a) Public bodies and administrations (e.g., governmental, city councils, tourist offices, etc.) may upload geolocated multimedia content relevant to the pilgrims' needs.
b) Accommodation facilities may upload news clips related to their activities, information about services available, recommendations, etc.
c) Pilgrims have their own online space to share content relevant to other users, in line with the Web 2.0 philosophy.

Additionally, a collection of interfaces have been developed to facilitate access to the different services that will enhance the experience of completing the Way of Saint James:

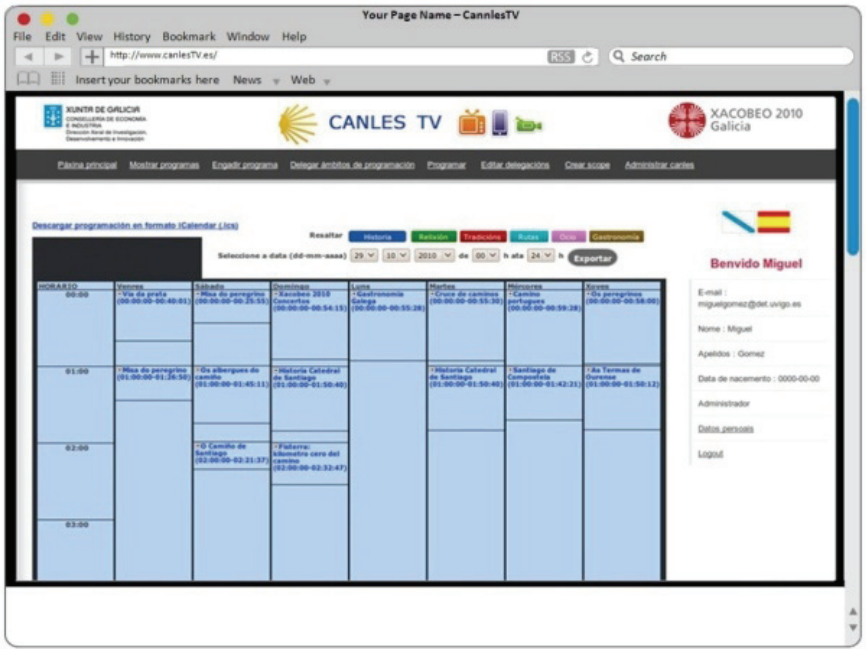
1 PC interface (cf. Fig. 1): it is a web portal where users can be assigned specific multimedia channels to generate their own programming grids. This interface provides a weekly programming schedule that users may populate with the desired multimedia content. Users may also select date or time slot ranges (e.g. prime-time)to manage the multimedia content that will be broadcasted at that time interval. The main activities that can be performed using this interface are:
a) Programming grid management (cf. Fig. 2). This is the default activity available upon signing in the PC interface.
b) Channel management. It encompasses all activities related to the creation, location, update and deletion of multimedia channels.
c) Chanel administration management. It covers all options to manage or delegate tasks to channel administrators, including the creation, update and deletion of managers and the tasks assigned to them.

FIGURE 1
MAIN ACCESS TO THE PC INTERFACE



2 Mobile interface: this access mode requires users, typically pilgrims, to have an Android [5] smartphone with at least 3G connectivity [6] to access online services. Through these mobile portal users can access to the information that best fits their profiles and interests from any location along the Way. The most relevantactivities that can be performed through this interface are:

FIGURE 2
MANAGING A PROGRAMMING GRID USING THE PC INTERFACE



a) Identify and browser content channels available in the vicinity of the user along the Way of St. James (cf. Fig. 3).
b) Report users' geolocation, either automatically with a GPS-enabled device [7]or through Google Maps[8].
c) Upload multimedia content (cf. Fig. 4) to the content repository. This content will be reviewed by designated administrators to guarantee that it complies with the requirements specified according to the established broadcast policies.
d) Geolocate content, by reporting the geographical scope of the content uploaded along the Way of St. James.

FIGURE 3
GEOLOCATING CONTENT USING THE MOBILE INTERFACE

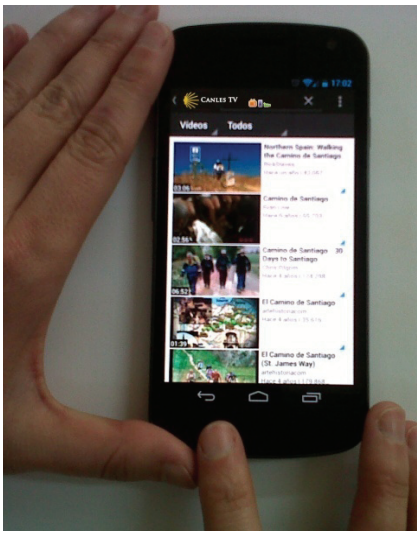
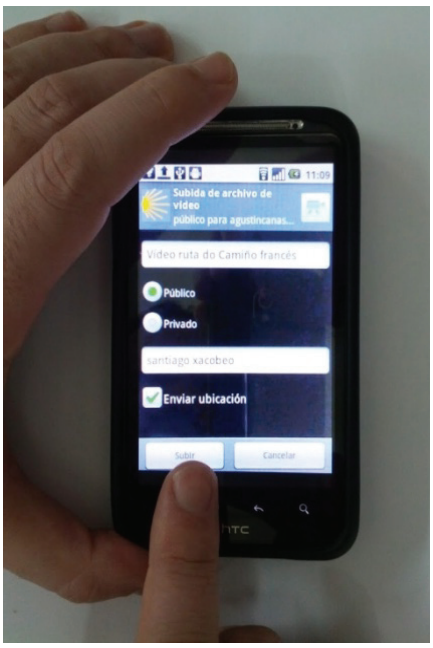


FIGURE 4
UPLOADING CONTENT USING THE MOBILE INTERFACE



3 TV-HTPC interface: this client application is aimed at pilgrims during their stay in accommodation facilities along the Way, where they will perform the role of *content consumers*. Through this interface, they can access multimedia material to prepare the nextstageswhile staying in shelters or hostels directly from the (HTPC-equipped) TV sets there. The main functions supported are:

a) Navigate through the channels relevant to the specific location (cf. Fig. 5).
b) Content visualization.
c) Access to the programming grid of specific channels, and select the desired content to enjoy (video-on-demand, cf. Fig. 6).

FIGURE 5
LOCATING CONTENT USING THE TV-HTPC INTERFACE

FIGURE 6
PLAYING CONTENT USING THE TV-HTPC INTERFACE

After the description of the main features of the platform developed in this research, we will now outline the preliminary results from its validation. Note that at the time of writing this paper, the project is still in its validation phase, a process that will be completed by August 2013.

We have designed a collection of mechanisms to validate the usability and satisfaction levels of potential users when interacting with the real system. More specifically, validation is being performed as follows:

1- First, the research team has validated the technical aspects of the multi-device platform, a common development activity in any hardware/software project. This processis yielding the expected results, that is, no major design or implementation problems have been detected.
2- Secondly, we selected a representative sample of each of the user roles involved in the platform. With them, we are conductinga pilot validation of the final system using and taking into account: (1) satisfaction questionnaires,(2) study and analysis of activity logs, (3) direct observations concerning user behavior and activities, and (4) comparison of the degree of satisfaction with that of pilgrimsnot having access to this platform.

According to the results obtained so far, we can conclude that the solution discussed in this paper has contributed to the overall improvement of the impact, connectivity and international dissemination of the Way of Saint James through a collection of channels providing geolocated and customized multimedia content.

We have developed a content delivery platform, accessible via the Internet, to disseminate audiovisual material through HTPC-enabled television sets available in accommodation facilities and pilgrims' mobile devices along the Way. This tool also facilitatescontent upload by pilgrims and the collaborative tagging and geolocation of this material, which will be eventually used to provide smart recommendations based on users' profiles.

Secondly, and besides the technological contributions carried out in the framework of this research, it should also be pointed out that this experience has improved the quality and relevance of the information that is now available to the pilgrims through the provided customized multimedia channels, which in turncontributed to an improvement of the efficiency of the promotion of the Way of St. James andthe promotion of tourism in general.

Finally, we may infer that this research represents a significant advance in the introduction of the latest information and communication technologies in a strategic economic sector in Galicia, Spain and other European countries as France or Portugal.

ACKNOWLEDGEMENTS

This work has been performed under the support of the European Regional Development Fund (ERDF) and the Galician Regional Government under projects: (i) “Fostering the Way of Saint James through personalized and geolocated TV channels” (10TIC050E) and (ii) "Consolidation of Research Units: AtlantTIC" (CN 2012/260), and the Spanish Ministry of Science and Innovation under grant “Methodologies, Architectures and Standards for adaptive and accessible e-learning (Adapt2Learn)” (TIN2010-21735-C02-01).

REFERENCES

[1] Official website of The Way of Saint James by Galician government. http://www.xacobeo.es/ [Last access in December 2012].

[2] Interactive TV. http://itvt.com/ [Last access in December 2012].

[3] Brief guide tothe Semantic Web. http://www.w3c.es/Divulgacion/GuiasBreves/WebSemantica [Last access in December 2012].

[4] HTPC. http://en.wikipedia.org/wiki/Home_theater_PC [Last access in December 2012].

[5] Android technology. http://www.android.com/about/ [Last access in December 2012].

[6] ITU. "What really is a Third Generation (3G) Mobile Technology". June 2009.

[7] GPS: Global Positioning System. http://en.wikipedia.org/wiki/Global_Positioning_System [Last access in December 2012].

[8] Google Maps API. https://developers.google.com/maps/?hl=es [Last access in December 2012].